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I certify that on November 16, 2001, which is the date I am signing this certificate, this correspondence and all identified attachments are being sent to the Commissioner for Patents, via U.S. Express Mail No. EL585705545US and addressed to Commissioner for Patents, Washington, DC 20231

Jessica Brown

(Type or print name of person mailing paper)

(Signature of person mailing paper)

**Serial No. To Be Assigned**

**Filed:** Herewith

**Title:** APPARATUS AND METHOD FOR  
CARRYING OUT ANALYSIS OF  
SAMPLES USING RADIATION  
DETECTOR OUTPUT RATIOS

**Applicant:** Gordon

**Group Art Unit No.** Unknown

**Examiner:** Unknown

**Serial No. of Parent:** 09/643,030

**Filed:** August 21, 2000

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner of Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Sir:

Please amend the above-identified application as follows prior to examination thereof:

In the Title

Please change the title of this divisional application as follows:

Apparatus and Method for Carrying Out Analysis of Samples Using Radiation Detector  
Output Ratios

In the Specification

Please amend the specification as follows:

Page 15 please amend the paragraph at line 24 which continues through line 10 on page 16 to amend "2a" to read -- 20a -- in the fifth line thereof as follows:

The optical system of Figure 3 comprises a light source 19, which may be for example a semi-conductor laser or a light emitting diode, arranged beneath the disc. The output beam 20 of the light source is directed to an optical axis 20a to a polarising prism (a beam splitter) 21 which

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allows only light of a given polarisation to pass, i.e. only the light received directly from the laser. The transmitted light is then incident upon a first lens 22 which is arranged to focus light onto the lower surface 23 of the reflective layer within the disc. A fraction of the light incident upon the compact disc is transmitted through the reflective layer and exits from the upper surface of the disc. Any material attached to the upper surface will interfere with light exiting the disc.

Please amend the paragraph commencing at line 12 on page 17 which continues to line 2 on line 2 on page 18 to change "Figure 2" to -- Figure 3 -- in line 1 as follows:

Although not shown in Figure 3 the optical block situated below the disc also incorporates tracking optics which enables the correct tracking of the disc tracks in a similar way to that used in conventional compact disc players. The tracking optics comprise a diffraction grating, located in this embodiment at plane 37 in Fig. 3, which splits the output from the laser into three parallel beams which are subsequently focused by the first lens to provide three slightly spaced-apart spots. The spacing between these spots is such that when the central spot is directly over the centre of one track the other two spots lie on either side of that track. The detector D1 actually comprises three adjacent detectors which receive reflected light and the spacing of which is equivalent to that between the beam spots. In order to align the laser correctly, the laser position is adjusted until the output from the centre detector is maximum and the outputs from the two side detectors is a minimum. A feedback control system is used to maintain the correct tracking.

Please amend the paragraph beginning on page 19 at line 19 which continues to line 8 of page 20 to correct "aperture 34" to -- aperture 53 -- in the fifth line thereof and to change "D3" to -- D2 -- in lines 4 and 5 on page 20 as follows:

In order to provide more stringent measure of the variations in the intensity of light transmitted through the disc the detector D3 is provided (although this is optional) which receives light from the partially transparent mirror through the aperture 53, lens 27 and pinhole arrangement 35. This arrangement effectively reduced the area of the disc surface from which light is received by the detector D3 and also reduces the depth of focus. If the output of detector D2, or the ratio D1:D2, exceeds a predetermined threshold the output of detector D3 can be used to increase the resolution with which the surface of the disc is viewed. The use of detectors D2

and D3 in combination prevents the likelihood of the detector D2 producing errors if the system used only detector D2. D3 may alternatively provide a second type of detector for detecting for example fluorescent light emitted by material attached to the surface of the disc.

On page 20, lines 15 to 22, please amend the paragraph to change "37" to -- 52 -- in the second line thereof as follows:

The optical inspection system has a 'U' shaped arm 36 with a light source 52 and a detector 38 attached to the upper and lower ends of the arm respectively. The source and detector are connected to a laser controller 39 and a buffer 40, the latter being arranged to transfer detected signal data to a personal computer 41 via an analogue to digital converter 42 and a data store 43.

On page 23, line 11, after "support surface", insert --(55)--; and on page, 23, line 12, after "disc", insert --(see FIG. 2)-- as follows:

It is also possible to construct the disc in such a way that the support surface (55) is internal to the disc (see FIG. 2) and is not the upper surface of the disc. This may provide the advantages that the sample is not damaged by handling and that a precise volume of sample may be analysed. To enable the system to be used for running gels (e.g. to identify proteins, DNA etc.), an appropriate gel may be provided on the upper surface of the disc. Electrodes for applying a potential across the gel may be formed integrally therewith or may be printed, or otherwise deposited, on the upper surface. The electrodes may be spaced radially or circumferentially. Pits may be provided in the gel into which the material to be run can be placed.

#### In the Claims

Please cancel Claims 2-13.

#### In the Drawings

Please amend the drawings as follows and as shown in redline in the attached copies of Figs. 2, 5 and 6 (sheets 1, 4 and 5) of the drawings.

In Fig. 2, the internal support surface referred to in the specification is shown diagrammatically, as seen in redline on the accompanying sheet 1 of the drawings.

Fig. 5, in the analog to digital converter indicated at 31 please change "D/A" to -- A/D -- as seen in redline on the accompanying sheet 4 of the drawings.

Fig. 6, please add reference numeral 39 to the laser controller representation in Fig. 6 as indicated in red line on the accompanying sheet 5 of the drawings.

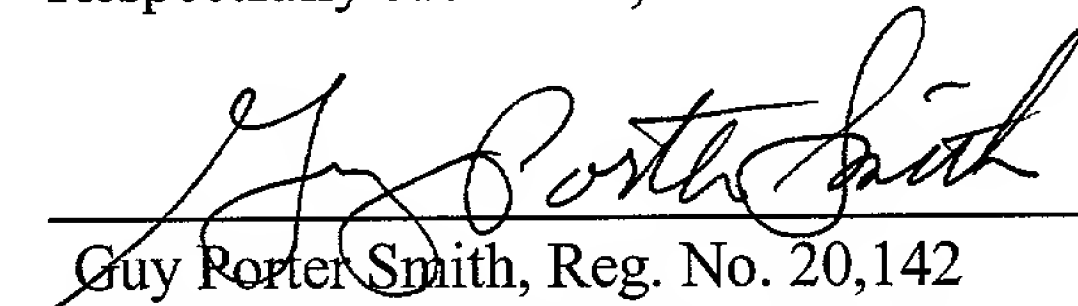
**REMARKS**

The written specification and drawing changes are the same as entered in the immediate parent application Serial No. 09/643,030. The Examiner's approval thereof is requested. A Supplemental Amendment will be filed adding claims.

Please charge any additional fees or credit any overpayments to account No. 16-2230.

Respectfully submitted,

Dated: November 16, 2001

  
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Los Angeles, California 90067  
(310) 788-5000 - Fax: (310) 788-5100

Marked Paragraphs from the Specification to Show Changes

Page 15 please amend the paragraph at line 24 which continues through line 10 on page 16 to amend "2a" to read -- 20a -- in the fifth line thereof as follows:

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In order to provide more stringent measure of the variations in the intensity of light transmitted through the disc the detector D3 is provided (although this is optional) which receives light from the partially transparent mirror through the aperture 53 [34], lens 27 and pinhole arrangement 35. This arrangement effectively reduced the area of the disc surface from which light is received by the detector D3 and also reduces the depth of focus. If the output of detector D2, or the ratio D1:D2, exceeds a predetermined threshold the output of detector D3 can be used to increase the resolution with which the surface of the disc is viewed. The use of detectors D2 and D3 in combination prevents the likelihood of the detector D2 [D3] producing errors if the system used only detector D2 [D3]. D3 may alternatively provide a second type of detector for detecting for example fluorescent light emitted by material attached to the surface of the disc.

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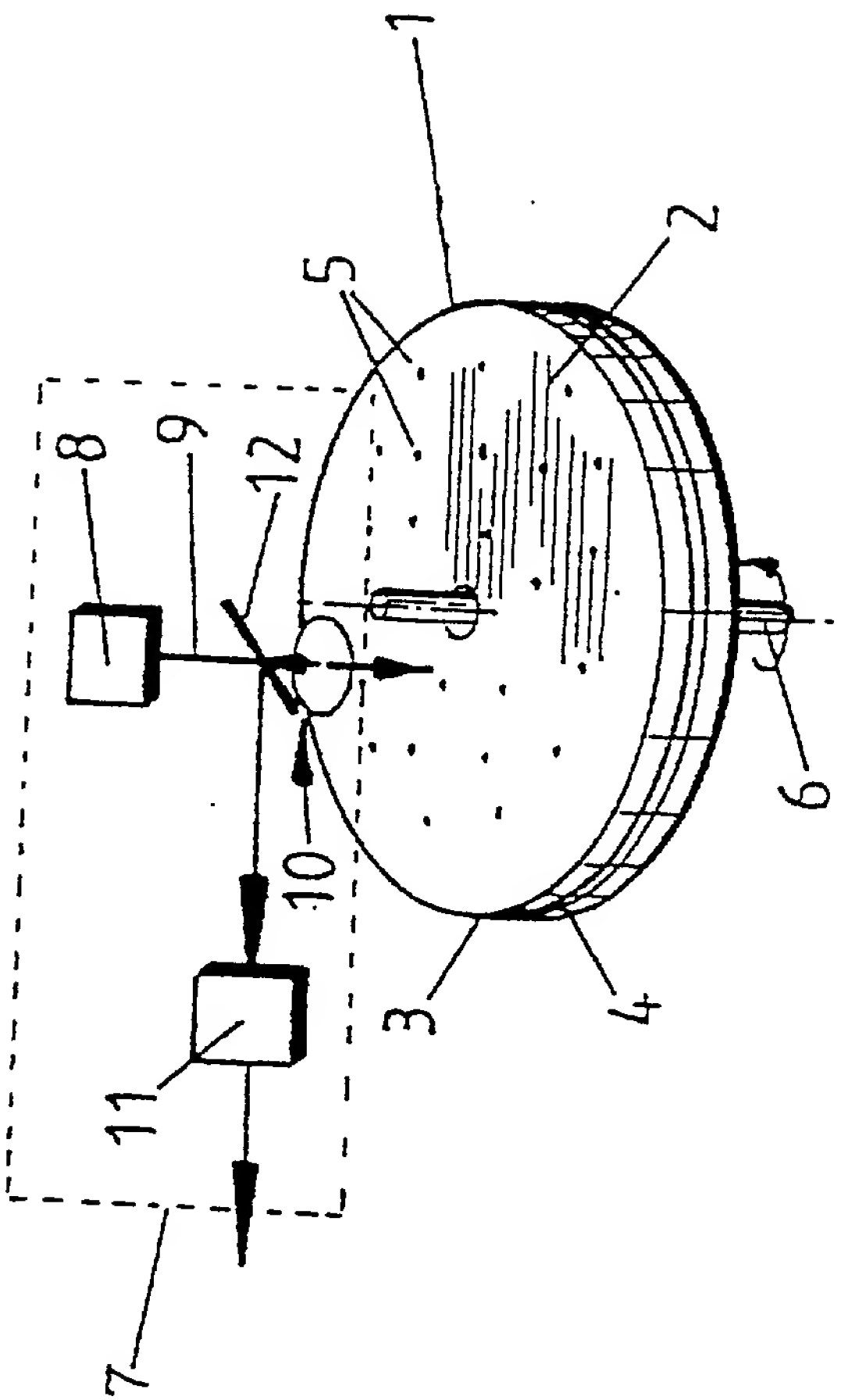


FIG. 1

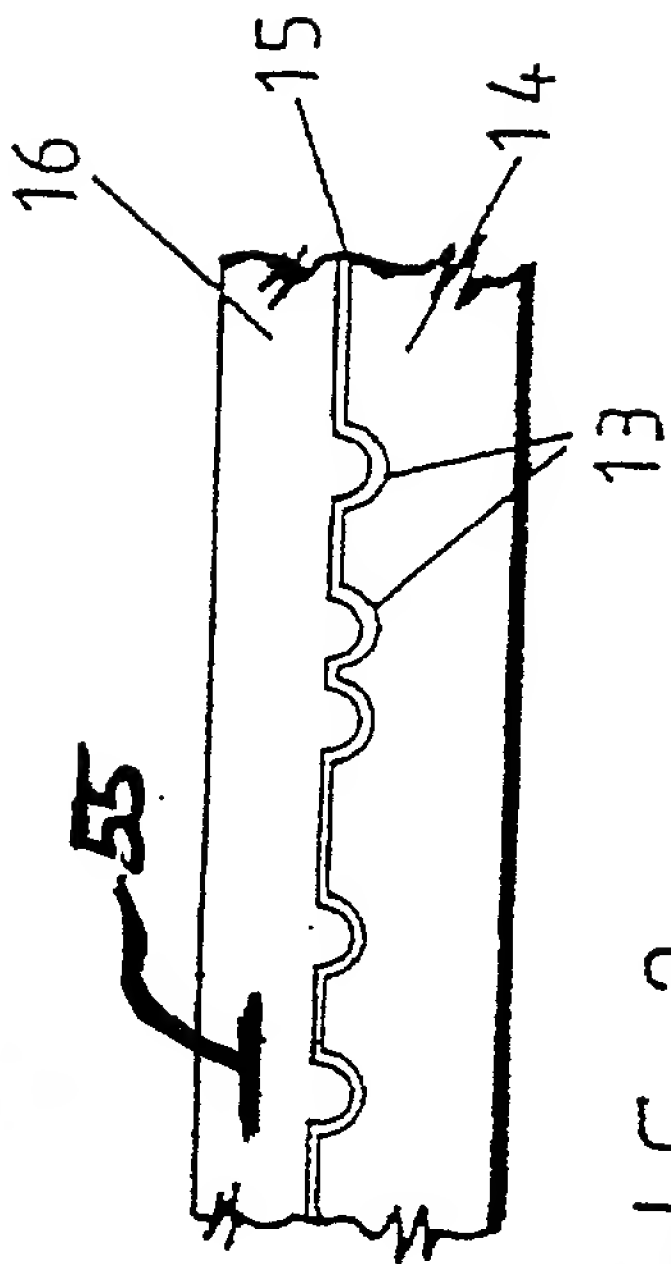


FIG. 2

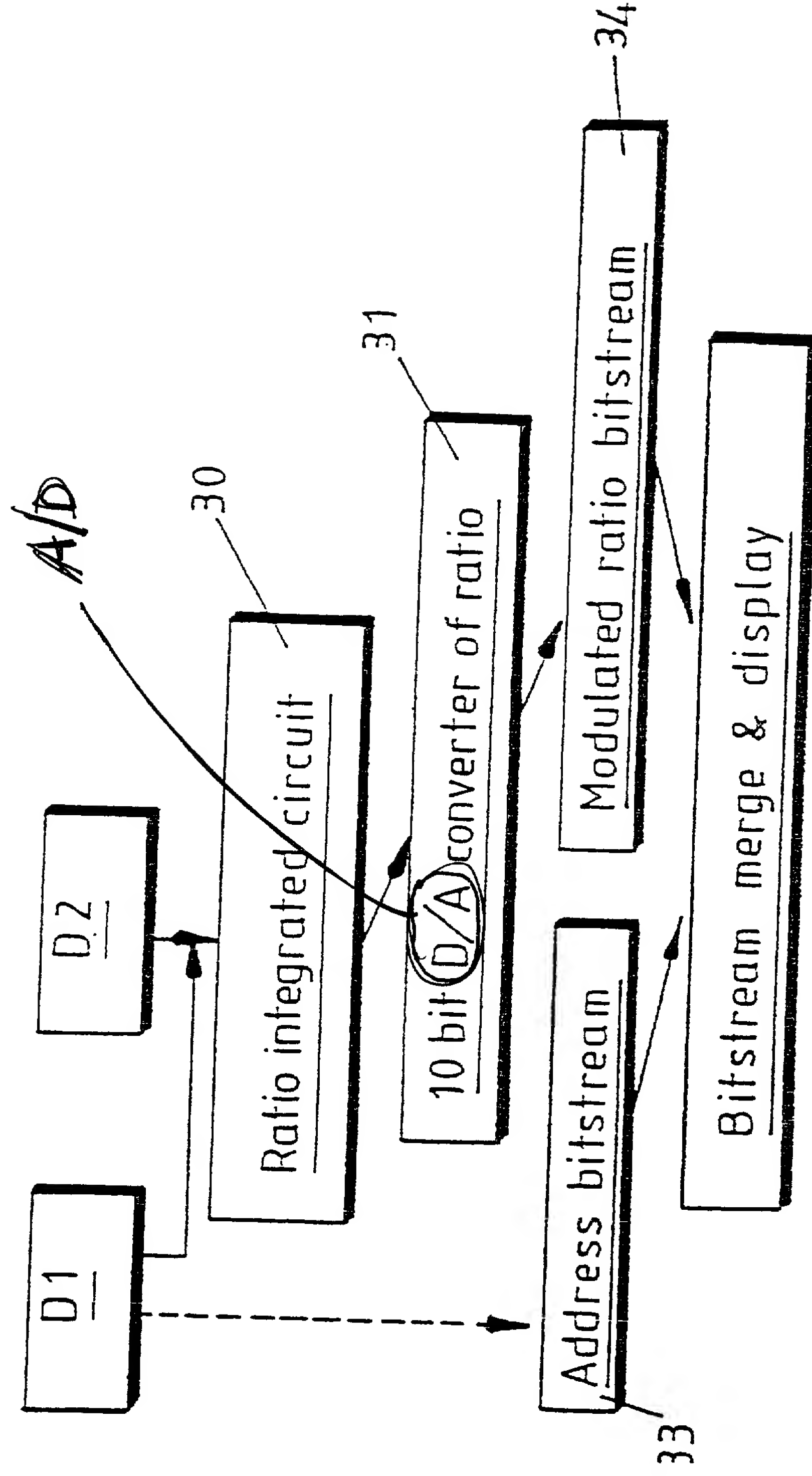


FIG. 5

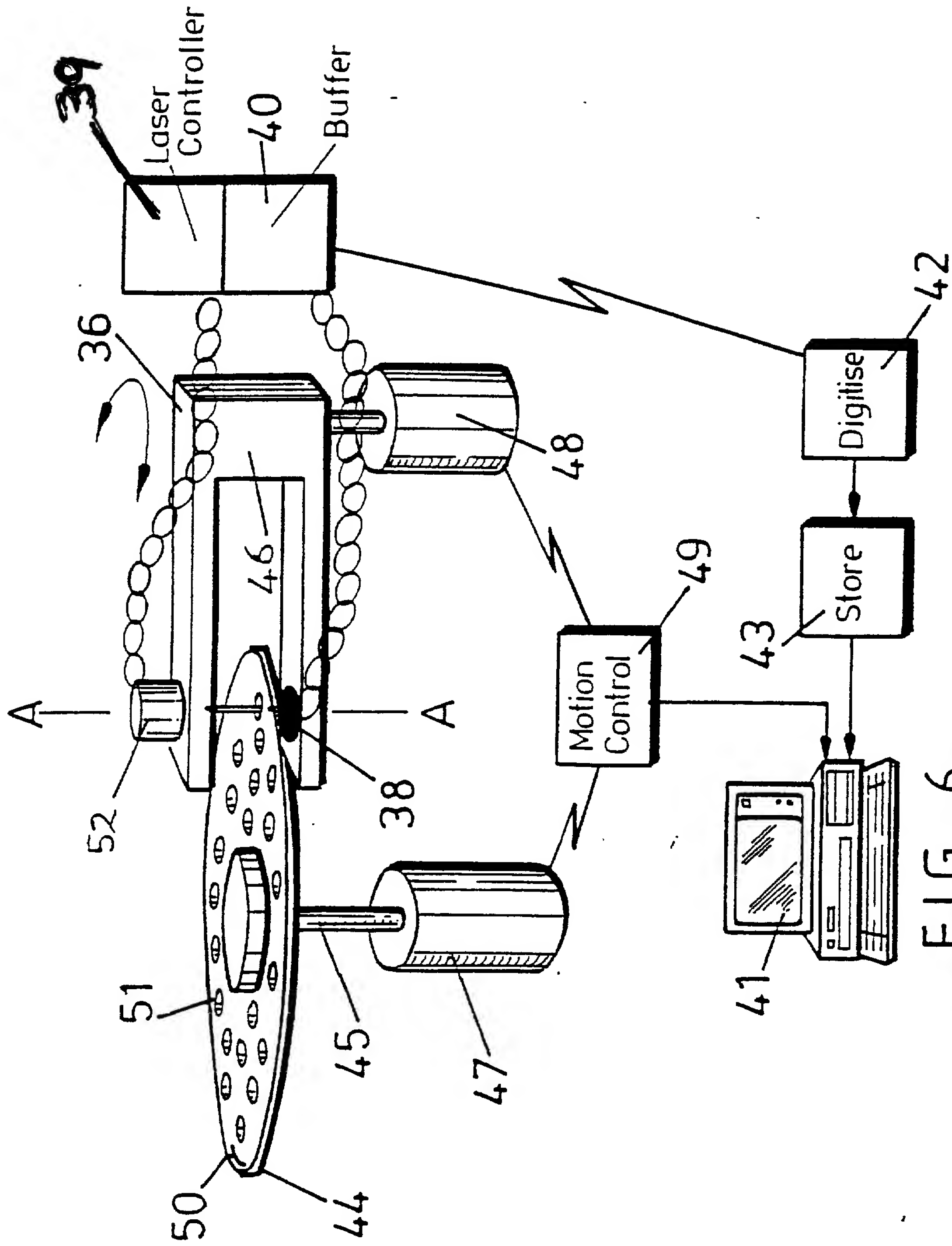


FIG. 6